

IMAGES IN INTERVENTION

Impella 5.0 Fracture and Transcatheter Retrieval



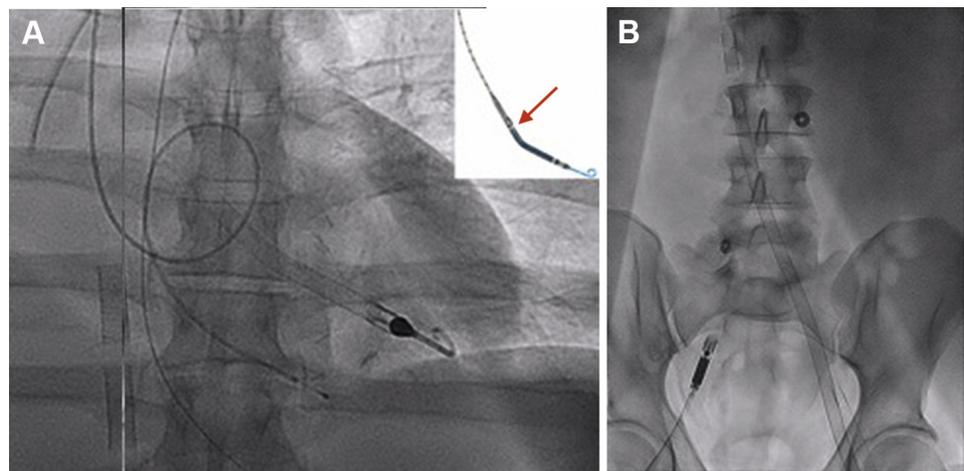
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A 35-year-old man with a history of Kawasaki disease presented in cardiogenic shock following ST-segment elevation myocardial infarction. He underwent percutaneous intervention of the culprit vessel. He subsequently sustained cardiac arrest, during which time an Impella 5.0 device (Abiomed, Danvers, Massachusetts) was placed

percutaneously via the right common femoral artery. The patient continued to experience ventricular tachyarrhythmias, and venoarterial extracorporeal life support was initiated. The Impella was left in the left ventricle to aid in decompression.

Over the next 5 days, biventricular function improved enough to consider weaning mechanical

FIGURE 1 Impella Fracture

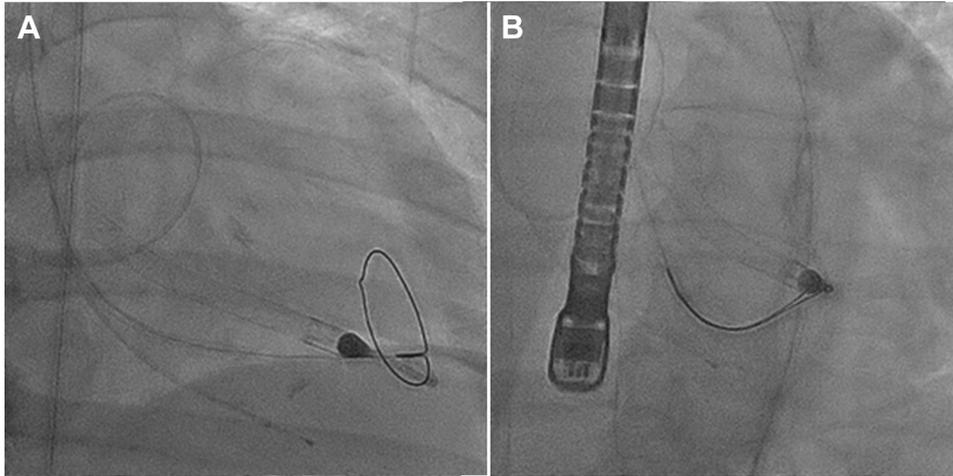


Baseline fluoroscopic views demonstrating the fractured Impella 5.0 device (Abiomed, Danvers, Massachusetts). **(A)** The distal ("pigtail") segment is positioned in the left ventricle. The proximal segment of the plastic tubing is positioned in the left ventricular outflow tract (just below the aortic valve). **(Inset)** Diagram showing site of fracture (**arrow**). **(B)** The outlet area of the Impella is seen withdrawn to the level of the right common iliac artery.

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Manuscript received August 30, 2016; accepted September 8, 2016.

FIGURE 2 Snare Retrieval

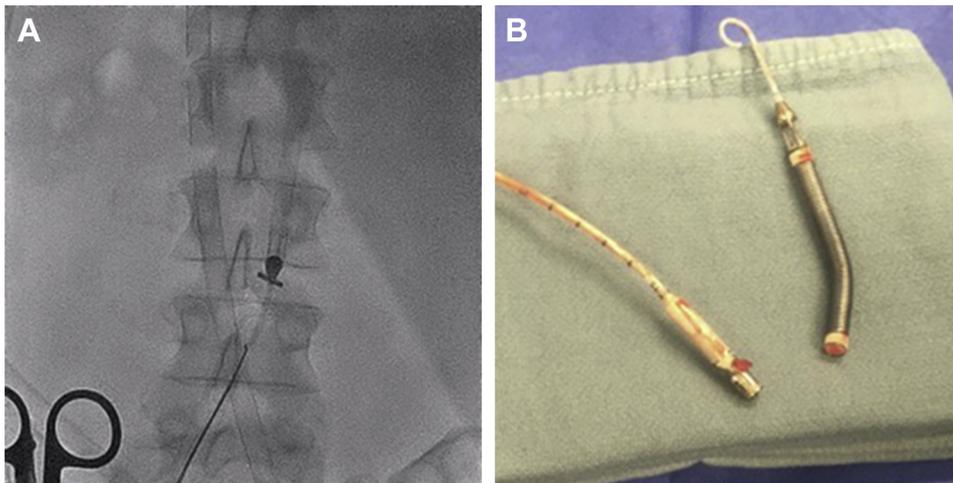


(A) An 8-F multipurpose-2 guide catheter is seen inserted into the left ventricle to assist delivery of a 36-mm Gooseneck snare (ev3 Endovascular, Plymouth, Minnesota) toward the distal tip of the Impella 5.0. **(B)** The 36-mm Gooseneck snare is seen capturing the pigtail portion of the Impella 5.0.

support. The Impella driveshaft was manually pulled back, but intraoperative transesophageal echocardiography failed to show a corresponding change in pump body position. Attempts to readvance the Impella were similarly unsuccessful. The Impella motor current was then noted to be flat, which

is worrisome for pump failure. When surveyed under fluoroscopy, we noted a fracture at the distal edge of the 21-F pump motor (now located in the right iliac artery near the repositioning sheath). The pigtail and inlet were still in the left ventricle (**Figure 1**).

FIGURE 3 Retrieved Impella



(A) The Impella 5.0 is retrieved into the 26-F Gore DrySeal sheath (W. L. Gore & Associates, Flagstaff, Arizona), with the distal end in first. **(B)** Ex vivo image of fractured segments.

The common femoral artery was exposed and controlled. To maintain wire access to the vessel lumen, the repositioning sheath was cut and removed. The Impella driveshaft was used as a rail to insert a 10-F sheath into the common femoral artery. A 0.035-inch J wire was then placed adjacent to the driveshaft into the descending thoracic aorta. With luminal wire access secured, the 10-F sheath was removed, followed by the 21-F Impella motor. A 26-F Gore DrySeal sheath (W. L. Gore & Associates, Flagstaff, Arizona) was advanced over the J wire. A 6-F multipurpose-2 guide catheter was inserted in the left ventricle, and a 36-mm Gooseneck snare (ev3 Endovascular, Plymouth, Minnesota) was directed to the left ventricular

apex. The pigtail was then snared and removed through the femoral sheath (**Figures 2 and 3**).

Neither fracture of an Impella device nor its successful transcatheter retrieval has been previously described (1,2). We highlight this case to demonstrate the importance of multidisciplinary collaboration and creative hybrid solutions for favorable patient outcomes.

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REFERENCES

1. Eftekhari A, Eiskjaer H, Terkelsen CJ, et al. Perforation of the anterior mitral leaflet after Impella LP 5.0 therapy in cardiogenic shock. *Am J Cardiol* 2016;117:1539-41.
2. Eleid MF, Melduni RM, Joyce DL. Snare-facilitated retrieval of entangled Impella device. *J Interv Cardiol* 2016;29:332-3.

KEY WORDS Impella, temporary circulatory support